What is claimed is:

1. A communication method to be performed by a mobile terminal with multiple antenna elements, comprising steps of:

(a) receiving the corresponding Rx vector signals from multiple antenna elements;

(b) calculating the suitable weight vector cor responding to the Rx vector signal of each antenna element according to the corresponding Rx vector signals;

(c) obtaining an output signal with maximum SNR (Signal-to-Noise Ratio) by weighting and then combining the Rx vector signals with the corresponding su itable weight vectors respectively.

2. The method according to claim 1, wherein step (b) includes:

(b1) calculating the autocorrelation matrix of said Rx vector signals with statistical method in time dimension;

(b2) calculating said suitable weight vectors accordin g to the autocorrelation matrix of the Rx vector signals.

3. The method according to claim 2, wherein step (b2) includes:

(b21) calculating the autocorrelation matrix of the vector channel responses according to said Rx vector signals;

(b22) calculating th e autocorrelation matrix of the vector noise according to the autocorrelation matrix of the vector channel responses and the autocorrelation matrix of said Rx vector signals;

(b23) calculating the suitable weight vector corresponding to the signal at the chosen time in said Rx vector signals, according to the autocorrelation matrix of the vector channel responses and the autocorrelation matrix of the vector noise.

4. The method according to claim 3, wherein said signal at the chosen time in said Rx vector signals is the signal at each time in said Rx vector signals.

5. The method according to claim 4, wherein step (b23) calculates said suitable weight vector $\underline{W}_{opt}$ according to the flowing formula:

$$R_{hh} \bullet \underline{W} = \lambda \bullet R_{zz} \bullet \underline{W}$$

Where :

Rhh is the autocorrelation matrix o f said vector channel responses;

Rzz is the autocorrelation matrix of said vector noise;

λ is the eigenvalue;

W is the weight vector ;

Wherein the weight vector $\underline{W}$ corresponding to the maximum value of λ is said suitable weight vector $\underline{W}_{opt}$.

6. The method acco rding to claim 2, wherein, said statistical method in time dimension is performed on the Rx vector signals over the chosen time range in said Rx vector signals so as to get the autocorrelation matrix corresponding to the Rx vector signals over the chosen t ime range in said Rx vector signals, wherein said determined suitable weight vector is the suitable weight vector corresponding to the Rx vector signals over the chosen time range in said Rx vector signals, the method further comprising steps of:

(b3) calculating the autocorrelation matrix of subsequent Rx vector signals according to the autocorrelation matrix of said Rx vector signals over the chosen time range;

(b4) determining the suitable weight vector of the subsequent Rx vector signals according to th e suitable weight vector of said Rx vector signals over the chosen time range and the autocorrelation matrix of the subsequent Rx vector signals;

7. The method according to claim 6, wherein step (b4) calculates the suitable weight vector of said subsequent Rx vector signals according to the following formula:

$$\underline{W}^{H}_{opt}(t+1) = R_{rr}(t+1) \bullet \underline{W}^{H}_{opt}(t) / (|| R_{rr}(t+1) \bullet \underline{W}^{H}_{opt}(t)||)$$

Where:

$R_{rr}(t+1)$ is the autocorrelation matrix of said subsequent Rx vector signals;

$\underline{W}^{H}{}_{opt}(t)$ is the conjugate transposition of the suitable weight vector of said Rx vector signals over said chosen time range;

$\underline{W}^{H}{}_{opt}(t+1)$ is the conjugate transposition of the suitable weight vector of said subsequent Rx vector signals;

$\| R_{rr}(t+1) \cdot \underline{W}^{H}{}_{opt}(t)\|$ means performing normal number operation on $R_{rr}(t+1) \cdot \underline{W}^{H}{}_{opt}(t)$.

8. A mobile terminal with multiple elements, comprising:

a receiving unit, for receiving the corresponding Rx vector signals from multiple antenna elements;

a calculating unit, for calculating the suitable weight vector corresponding to the Rx vector signal of each element according to the corresponding Rx vector signals; and

a combining unit, for weighting and then combining the Rx vector signals with the corresponding suitable weight vectors respectively, to obtain an output signal with maximum SNR.

9. The mobile terminal according to claim 8, wherein said calculating unit calculates the autocorrelation matrix of said Rx vector signals with statistical method in time dimension, and calculates said suitable weight vector according to the autocorrelation matrix of said Rx vector signals.

10. The mobile terminal according to claim 9, wherein said calculating unit calculates the autocorrelation matrix of the vector channel responses according to said Rx vector signals; calculates the autocorrelation matrix of the vector noise according to the autocorrelation matrix of the vector channel responses and the autocorrelation matrix of said Rx vector signals; and calculates the suitable weight vector corresponding to the signal at the chosen time in said Rx vector signals according to the autocorrelation matrix of the vector channel responses and the autocorrelation matrix of the vector

noise.

11. The mobile terminal according to claim 10, wherein the signal at the chosen time in said Rx vector signals is the sign al at each time in said Rx vector signals.

12. The mobile terminal according to claim 11, wherein said calculating unit calculates said suitable weight vector $\underline{W}_{opt}$ according to the following formula:

$R_{hh} \cdot \underline{W} = \lambda \cdot R_{zz} \cdot \underline{W}$

Where:

R_{hh} is the autocorrelation matrix of said vector channel responses;

R_{zz} is the autocorrelation matrix of said vector noise;

λ is the eigenvalue;

$\underline{W}$ is the weight vector;

Wherein the weight vector $\underline{W}$ corresponding to the maximum value of λ is said suitable weight vector $\underline{W}_{opt}$.

13. The mobile terminal according to claim 9, wherein said statistical method in time dimension is performed on the Rx vector signals over the chosen time range in said Rx vector signals so as to get the autocorrelation matrix corresponding to the Rx vector signals over t he chosen time range in said Rx vector signals, wherein said determined suitable weight vector is the suitable weight vector corresponding to said Rx vector signals over the chosen time range, said calculating unit calculates the autocorrelation matrix of subsequent Rx vector signals according to the autocorrelation matrix of the Rx vector signals over the chosen time range, and determines the suitable weight vector of the subsequent Rx vector signals according to the suitable weight vector of the Rx vector signals over the chosen time range and the autocorrelation matrix of the subsequent Rx vector signals.

14. The mobile terminal according to claim 13, wherein said calculating unit calculates the suitable weight vector of said subsequent Rx vector signals according to the following formula:

$\underline{W}^{H}_{opt}(t+1) = R_{rr}(t+1) \cdot \underline{W}^{H}_{opt}(t) / (\| R_{rr}(t+1) \cdot \underline{W}^{H}_{opt}(t) \|)$

Where:

$R_{rr}(t+1)$ is the autocorrelation matrix of said subsequent Rx vector signals;

$\underline{W}^{H}_{opt}(t)$ is the conjugate transpos ition of the suitable weight vector of said Rx vector signals over the chosen range time;

$\underline{W}^{H}_{opt}(t+1)$ is the conjugate transpos ition of the suitable weight vector of said subsequent Rx vector signals;

$\| R_{rr}(t+1) \cdot \underline{W}^{H}_{opt}(t) \|$ means performing normal number operation on $R_{rr}(t+1) \cdot \underline{W}^{H}_{opt}(t)$.